

# Orbital Architecture of a Seven-Planet System on a Galactic Scale — Inspired by Vedic Cosmology

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## Abstract

This article advances a cosmologically scaled model that synthesizes ancient Vedic symbolism with contemporary celestial mechanics. Drawing from the *R̥gveda*'s depiction of seven rays or horses yoking the Sun's chariot and the expansive timescales outlined in the *Mahābhārata* and *Bhagavad Gītā*—such as the Kalpa, equivalent to 4.32 billion solar years—we construct a hypothetical ring of seven Earth-like planets orbiting a Sun-like star. Precise calculations reveal an orbital period of approximately 617 million years per planet, resulting in a semi-major axis of 11.46 light-years. The system exhibits gravitational stability over galactic timescales, with inter-planet light-signal delays of 9.95 years, echoing a cosmic “fortnight” of 69.62 years. This framework not only bridges ancient philosophy and modern astrophysics but also proposes a novel “space geography” for the ring, transforming symbolic elements into a scientifically coherent cosmic architecture.

## 1 Introduction

The *R̥gveda*, one of the oldest known texts, vividly describes the Sun's chariot yoked by seven elements—often interpreted as rays, horses, or reins—pulling a single-wheeled vehicle across the cosmos (1.164.2 and 1.164.48). This imagery, combined with Hindu cosmology's vast temporal cycles like the Kalpa (a “day” of Brahma lasting 4.32 billion years, comprising 1,000 Mahāyugas), invites a reinterpretation through the lens of modern science. Rather than viewing these as purely metaphorical, we model them as a stable planetary ring: seven Earth-mass worlds equally spaced around a solar-mass star, with orbital dynamics derived from dividing the Kalpa by seven “rays.”

This study refines prior conceptualizations by incorporating precise astrophysical computations, evaluating system stability, and introducing a detailed “space geography.” The result is a hypothetical construct that honors Vedic harmony while adhering to gravitational laws, potentially inspiring searches for analogous exoplanetary systems.

## 2 Methods: Theoretical Framework and Calculations

### 2.1 Time Constant Derivation

The foundational timescale is the Kalpa, defined as  $4.32 \times 10^9$  solar years. Dividing by the seven rays yields the orbital period per “ray” or planet:

$$t_1 = \frac{4.32 \times 10^9 \text{ yr}}{7} \approx 6.17142857 \times 10^8 \text{ yr}.$$

This  $t_1$  represents the synodic or orbital period in the ring system.

## 2.2 Orbital Parameters

Using Kepler’s Third Law for a circular orbit around a  $1 M_{\odot} star$  :  $a = \left( \frac{GM_{\odot}t_1^2}{4\pi^2} \right)^{1/3}$ , where  $G$  is the gravitational constant. Computations yield:

- Semi-major axis  $a \approx 1.08 \times 10^{14} \text{ km} \approx 7.25 \times 10^5 \text{ AU} \approx 11.46 \text{ light-years}$ .

The angular spacing is  $360^\circ/7 \approx 51.428571^\circ$ . The chord distance between adjacent planets is:

$$s = 2a \sin\left(\frac{\pi}{7}\right) \approx 9.41 \times 10^{13} \text{ km} \approx 9.95 \text{ light-years}.$$

## 2.3 Light-Signal Dynamics

The light-crossing time between neighbors is:

$$\tau = \frac{s}{c} \approx 9.95 \text{ years},$$

where  $c$  is the speed of light. The full circuit time is  $7\tau \approx 69.62$  years, symbolizing a cosmic *pakṣa* (fortnight) scaled to galactic rhythms.

## 2.4 Stability Analysis

Each planet’s Hill radius is:

$$r_H = a \left( \frac{M_{\oplus}}{3M_{\odot}} \right)^{1/3} \approx 1.08 \times 10^{12} \text{ km}.$$

The required minimum gap for stability is  $2r_H \approx 2.17 \times 10^{12} \text{ km}$ , which is far less than  $s$ , confirming dynamical stability over the Galaxy’s  $\sim 10\text{--}13$  billion-year age. Perturbations from interstellar influences are negligible at this scale.

Calculations were performed using *astropy* for precision, ensuring alignment with physical constants.

# 3 Key Findings: System Characteristics and Implications

## 3.1 Vast Interstellar Scale

The ring’s radius positions it in interstellar space, dwarfing known systems (e.g., the Kuiper Belt at  $\sim 50 \text{ AU}$ ). This scale evokes the Vedic “drifting” chariot, with the central Sun as the “one horse with seven names.”

## 3.2 Gravitational and Temporal Harmony

Wide spacing ensures minimal mutual perturbations, allowing the system to persist for eons. The  $\sim 10$ -year light echoes create a rhythmic “mantra” circulation, where signals from one world reach the next after a decade, fostering hypothetical synchronized civilizations.

## 3.3 A Novel Space Geography

We map the “Seven-Ray Ring” as a heptagonal mandala, with each Earth embodying a Vedic ray. Viewed top-down:

- **Central Sun:** The unifying chariot hub.
- **Seven Earths:** Positioned at equal intervals, each with analog terrains inspired by Vedic sevenfold divisions (e.g., seven sages, cows, or wheels).

Table 1: Space Geography of the Seven-Ray Ring

| Earth | Symbolic Ray  | Terrain Features                       | Vedic Echo                   | Chord to Neighbors |
|-------|---------------|----------------------------------------|------------------------------|--------------------|
| 1     | Dawn Light    | Rolling hills, perpetual blooms        | Seven sages guiding creation | 9.95 light-years   |
| 2     | Rising Ray    | Volcanic peaks, fiery calderas         | Seven horses accelerating    | 9.95 light-years   |
| 3     | Zenith Beam   | Tropical forests, braided rivers       | Seven cows nurturing         | 9.95 light-years   |
| 4     | Noon Shadow   | Towering plateaus, shadowed canyons    | Seven sisters singing        | 9.95 light-years   |
| 5     | Waning Glow   | Glacial expanses, rotating ice wheels  | Seven reins controlling      | 9.95 light-years   |
| 6     | Twilight Veil | Misty forests, bioluminescent grottoes | Seven wheels turning         | 9.95 light-years   |
| 7     | Horizon Fade  | Arid badlands, wind-sculpted monoliths | Seven names of the courser   | 9.95 light-years   |

This geography integrates gravitational “valleys” and light “rivers,” with mutual tides syncing to the cosmic cycle.

## 4 Discussion

This model transcends symbolism by demonstrating physical plausibility, potentially detectable via long-baseline interferometry or future exoplanet surveys. It aligns with Hindu cosmology’s cyclic nature, where creation and dissolution span Kalpas. Limitations include assuming isolated dynamics; real systems might face galactic perturbations. Future work could simulate N-body evolution or explore bio-cultural implications for ring inhabitants.

## 5 Conclusions

The Seven-Ray Ring exemplifies the convergence of ancient wisdom and scientific inquiry, offering a stable, grand-scale planetary system that mirrors Vedic poetry. By quantifying the unquantifiable, we reveal a universe where gravity and mantra resonate as one.

## 6 References

- Sources drawn from Vedic texts and cosmological interpretations as cited inline. For full translations, consult primary scriptures like the *R̥gveda* and *Bhagavad Gītā*.